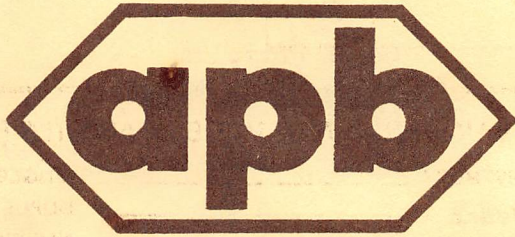


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WASTEWATER TREATMENT A Ten Year Perspective

A DECADE OF ACHIEVEMENTS

Since 1970 numerous legislative actions and \$25 billion in federal funds plus billions in State and local dollars have been directed at reducing pollutants discharged from municipal and industrial wastewater treatment facilities into surface water bodies. Municipal treatment facilities were the primary recipients of federal funds under the 1972 Clean Water Act, which provided the impetus for reducing the sources of water pollution.

In 1970, 113 public wastewater treatment facilities were in operation in Palm Beach County. Urbanization of the County placed it fifth of 67 counties in Florida in construction of new wastewater treatment facilities. In South Florida only Dade and Broward counties exceeded Palm Beach in the use of said facilities.

Passage of the Clean Water Act in 1972, established criteria which many of the 113 facilities in the county could not meet. Therefore, substantial modifications in methods of treatment and disposal were necessary for these plants to meet the new standards.

To assess the effectiveness of the actions taken in Palm Beach County during the decade since 1970 a comparison was made between the "sewerage" elements of the 1970 report entitled Comprehensive Water Supply, Sewerage Solid Waste and Air Pol-

lution Control Plan, and the 1980 Update, of the same report. Each report provides a detailed inventory of treatment facilities and relevant operational characteristics.

Several achievements which are related to the goals of the Clean Water Act, and discussed further in this article are:

1. Reduction in the number of treatment facilities (i.e. package plants);
2. Provision of a higher level of treatment prior to effluent discharge; and
3. Reduction in the total number of facility discharges to surface waters (i.e. ocean outfalls and direct effluent discharges).

Consolidation and Expansion of Treatment Facilities

In 1970, public sewerage facilities consisted of 34 major plants which served 231,000 persons. Major facilities in 1979 had been increased by 11 treatment plants, providing service to more than twice the population served in 1970. (See TABLE 1)

An estimated 15,000 people in 1970, were served by 79 small facilities (package plants). By 1979, eighteen of the small facilities, serving 3,000 people, were phased out by major facilities.

During the ten year period wastewater treatment capacity was increased by over 21 million gallons per day (MGD). In addition to the construction of new and expanded facilities, many have upgraded the treatment processes used. (See INSERT A)

TABLE 1

Major Facilities Comparison

<u>Year</u>	<u>Number of Facilities</u>	<u>Maximum Capacity</u>	<u>Population Served</u>
1970	34	70.9 MGD	231,000
1979	45	92.0 MGD	475,000

Ocean Outfalls

During the 1970's the status of ocean outfalls was substantially altered. In 1970, four outfalls were operating within the county at Palm Beach, Lake Worth, Delray Beach and Boca Raton. The four outfalls were designed for the disposal of, essentially, raw sewage. Only a minimum treatment of grinding and chlorination was provided prior to disposal.

The previously identified 1970 report was primarily concerned with the detrimental effects of high nutrient levels, bacteria, and virus development in sewage, and recommended a minimum of tertiary treatment for all sewage treatment systems.

In 1973, an Environmental Impact Statement (EIS) for "Wastewater Disposal Systems in S. E. Florida," narrowed the scope of study to, "the effect effluent can have on reef areas." Consequently, the U.S. Environmental Protection Agency developed its own recommendations which permit a minimum of secondary treatment in some cases.

Since the 1973 study two outfalls (Palm Beach and Lake Worth) have been eliminated. The remaining two discharge sewage which has received secondary treatment by the Delray Beach and Boca Raton treatment plants. (See TABLE 2)

EPA also recommended a monitoring program be instituted in conjunction with any future outfalls. To this date the program has not been started. No additional outfalls have been constructed in Palm Beach County since 1973.

TABLE 2
Ocean Outfalls
(average daily flows)

<u>Name</u>	<u>1970</u>	<u>1979</u>
Palm Beach	4.0 MGD	None
Lake Worth	3.0 MGD	None
Delray Beach	2.0 MGD	4.1 MGD
Boca Raton	1.1 MGD	4.2 MGD
Total	10.1 MGD	8.3 MGD

Septic Tanks

A 1970 report stated that clusters of privately owned sewerage systems and septic tanks..."indicate the need for additional public sewer construction."

Although major wastewater treatment facilities were designed to meet the needs of the populated areas with heavy septic tank concentrations and new development, few of the areas on septic tanks were connected to central sewer systems. Eighteen municipalities continue to use septic tanks either in conjunction with package plants or central sewerage systems with nearly half of the 18 depending exclusively on septic tanks. (See TABLE 3) In 1979 there were estimated to be 25-27,000 septic tanks in Palm Beach County serving approximately 70,000 persons.

TABLE 3

Wastewater Facilities by Municipality

<u>Area</u>	<u>Name</u>	<u>Facility</u>
1a	Jupiter Inlet Colony Tequesta	Septic Septic/Sewer
1b	Jupiter	Septic/Sewer
1c	Juno Palm Beach Gardens North Palm Beach Lake Park	Septic/Sewer Sewer Sewer Sewer
1d	Riviera Beach Palm Beach Shores Mangonia Park	Sewer Septic Septic/Sewer

TABLE 4
Surface Water Discharge
Comparisons*

			1970		1979	
			Treatment	None to Secondary	Secondary	
2a	West Palm Beach	Sewer	Average Flow (MGD)	19.3	7.6 (3.8)**	
	Palm Beach	Sewer				
2b	Glen Ridge	Septic				
	Haverhill	Septic				
	Lake Clarke Shores	Septic				
	Cloud Lake	Septic				
	Golfview	Septic				
2c	Palm Springs	Sewer	Capacity	NA	11.9 (7.5)**	
	Greenacres City	Septic/Sewer				
	Atlantis	Sewer				
	Lake Worth	Sewer/Septic				
	South Palm Beach	Sewer				
	Lantana	Sewer				
3a	Manalapan	Septic/Package				
	Hypoluxo	Septic				
	Boynton Beach	Sewer				
	Ocean Ridge	Septic/Package				
	Briny Breezes	Septic/Package				
	Gulfstream	Septic				
	Golf	Sewer				
3b	Delray Beach	Sewer				
3c	Boca Raton	Sewer				
	Highland Beach	Sewer				
4	Pahokee	Sewer				
	Belle Glade	Sewer				
	South Bay	Sewer				
	Royal Palm Beach	Sewer				

*Includes small facilities

**Subsequent to the elimination of Boynton Beach discharge.

manner, the largest single contributor being phased out in 1980 and incorporated into the South Central Regional treatment and ocean outfall facility.

A major change in disposal was the conversion of West Palm Beach from a Lake Worth discharge line to a deep-well injection system.

The effort to eliminate surface water pollution has resulted in significant increase in on-site containment facilities which rely primarily upon evaporation and percolation of effluent. The increase in number of such facilities has stimulated concern over the impact effluent might have upon groundwaters. Because the major source (approximately 90%) of South Florida's potable water is groundwater, a protective concern should be expected and further studies undertaken by state and local agencies to conclusively determine the effects upon groundwaters.

Further Efforts Needed

Although point sources (municipal and industrial discharges) have received substantial funding in the past, EPA estimated early in the 1970's that point sources accounted for only approximately 15% (nationally) of the overall pollutants of surface waters. Non-point sources, which include agricultural and urban runoff accounted for the balance (85%) of pollutant loadings.

Only a combined effort toward controlling point sources and non-point sources will provide the necessary reduction in pollution.

Disposal




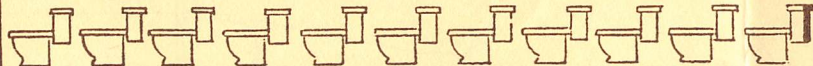



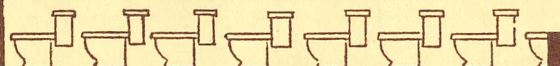
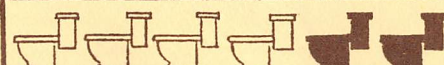

Passage of the Federal Water Pollution Control Act of 1972 directed pollution control efforts toward eliminating surface water discharges. The primary vehicle for controlling point source (direct) discharges is the National Pollutant Discharge Elimination System (NPDES), which is a federal permitting program. NPDES establishes compliance schedules that require systematic discharge reductions over a specified period. This policy has resulted in the reduction of discharges to ocean, estuarine, and fresh water bodies. (See TABLE 4)

Levels of treatment have been increased by most major and small facilities, accompanied by substantial reductions in the quantity of effluent being discharged to surface waters. In the eastern portion of the county only 4 major facilities continue to dispose of treated effluent in this










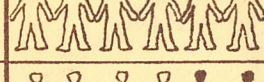

WASTEWATER SERVICE CAPACITY

BY POPULATION SUBAREA

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1a	< 1 MGD (declined to 0)
1b	
1c	
1d	 (declined)
2a	
2b	
2c	
3a	
3b	
3c	
4	

(1 commode = 2 million gallons/day)

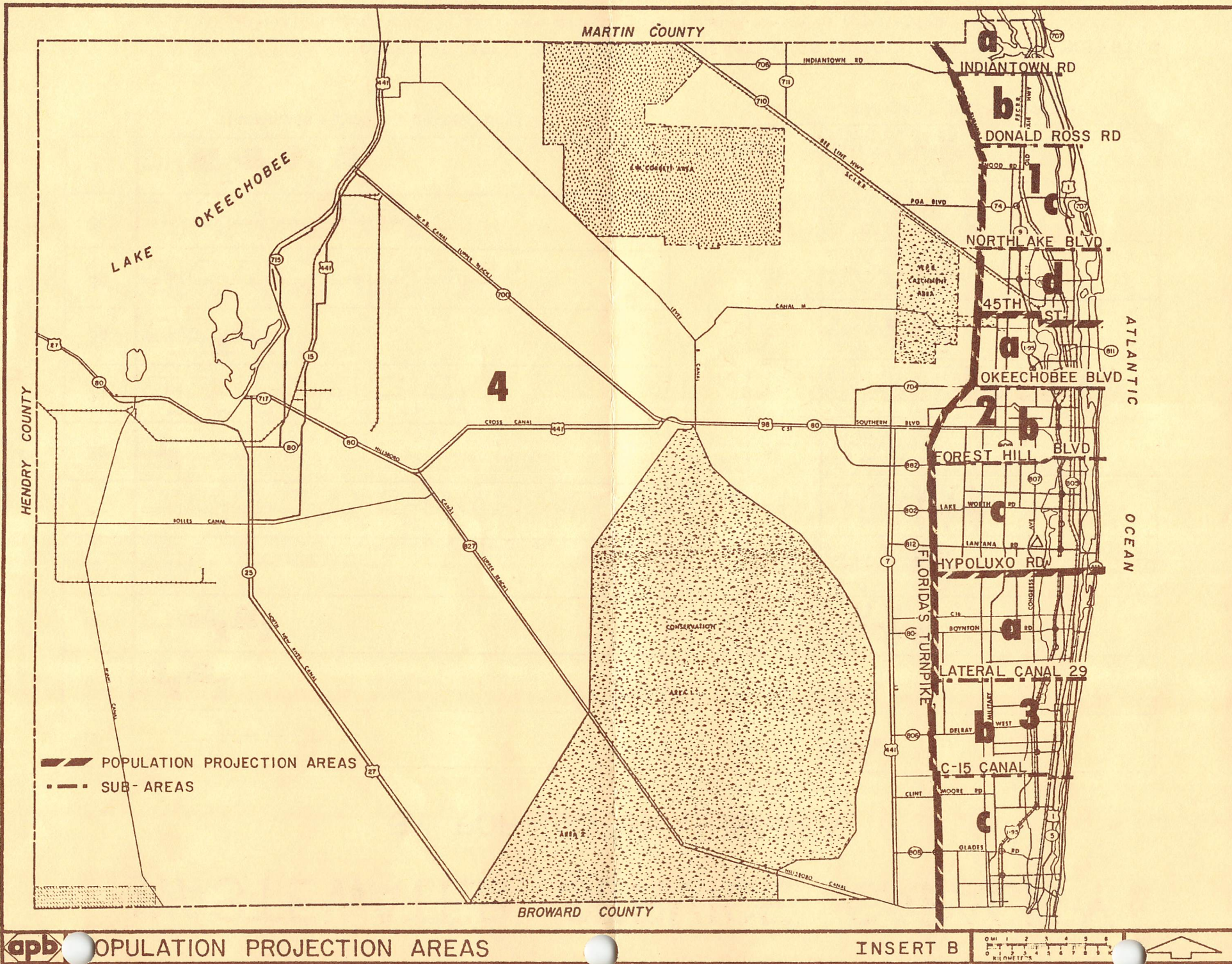
1a	
1b	
1c	
1d	
2a	
2b	
2c	
3a	
3b	
3c	
4	

(1 figure = 10,000 persons)

DARKENED AREA REPRESENTS INCREASE OVER 1970

INSERT A

Does not necessarily indicate direct relationship between population and capacity within geographic areas. (See INSERT B for geographic areas)





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